

L Number	Hits	Search Text	DB	Time stamp
1	346	((flip adj chip) and (plastic with (flow or deformation)))	USPAT; US-PGPUB	2004/04/27 10:56
2	164	((flip adj chip) and (plastic with (flow or deformation))) and @ad<20000310	USPAT; US-PGPUB	2004/04/27 10:57

US-PAT-NO: 5714252

DOCUMENT-IDENTIFIER: US 5714252 A

TITLE: Deformable substrate assembly for
adhesively bonded electronic device

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Brief Summary Text - BSTX (12):

Unfortunately, the elimination of the solder reflow step provides no mechanism to accommodate imperfections in bump height variability, trace height variability on the substrate, substrate warp age and non-uniformity in bond pressure distribution. Hatada states in col. 1 of the '120 patent that imperfections, such as lack of circuit board flatness, can compromise the reliability of the solder connections in the C4 process. Considering the rigid, high modulus materials (glass, ceramic, resin or a metal, see col. 3, lines 37-41 of Hatada) used as substrates in his processes, and the metals having relatively low yield stresses (Au, Ag, Cu, solder) which are used as bump materials, it is clear that plastic deformation of the bumps must compensate for such imperfections and preserve the reliability of the electrical connection. However, plastic deformation of the bumps often requires unacceptably high bonding force requirements. In addition, accelerated reliability tests indicate that the pressure engaged connections described in Hatada typically have a limited ability to accommodate relaxations and strains in the adhesive matrix. If high density arrays of integrated circuit devices are to be reliably electrically connected

to circuit structures, an adhesively bonded circuit assembly must be engineered to accommodate variations in bump height and bond pressure across the bond area while allowing a reduction in bonding forces.

Brief Summary Text - BSTX (17):

The patterned circuit traces disposed on a surface of the substrate must be made of a ductile metallic material with a thickness sufficient to permit small-scale/localized plastic deformation at the bonding temperature without tearing. These material properties permit the IC bonding element to initially locally deform the traces and then press portions of them into the surface of the substrate during the bonding procedure.